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IS 4601-2 (1968): Navigation lights for large sea going power driven vessels, Part 2 Oil lanterns [TED 19: Marine Engineering and Safety Aids]



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Reaffirmed 1988

IS : 4601 (Part II) - 1968

Indian Standard

NAVIGATION LIGHTS FOR LARGE
SEA-GOING POWER-DRIVEN VESSELS

PART II OIL LANTERNS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*Indian Standard*NAVIGATION LIGHTS FOR LARGE
SEA-GOING POWER-DRIVEN VESSELS

PART II OIL LANTERNS

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*Indian Standard*NAVIGATION LIGHTS FOR LARGE
SEA-GOING POWER-DRIVEN VESSELS

PART II OIL LANTERNS

0. FOREWORD

0.1 This Indian Standard (Part II) was adopted by the Indian Standards Institution on 23 April 1968, after the draft finalized by the Marine Instruments and Safety Aids Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 Navigation lights are to be carried and exhibited by sea-going power-driven vessels in all weathers from sunset to sunrise. These lights may also be exhibited from sunrise to sunset in restricted visibility and in all other circumstances when it is deemed necessary.

0.3 This standard is one of a series of Indian Standards on navigation lights for use on board large sea-going vessels.

0.4 This standard is based on the International Regulations for Preventing Collisions at Sea.

0.5 This standard generally incorporates the requirements under the *Merchant Shipping Act, 1958* and the rules made thereunder; and in addition general requirements and testing of navigation lights for large sea-going power-driven vessels is subject to the approval by the Government of India under the said Act and Rules.

0.6 This standard is necessary since navigation lights have to be so fixed, positioned and screened that each of the light concerned is projected in the direction required by the International Regulations for Prevention of Collisions at Sea, and is not obstructed by fittings such as derricks housed vertically.

0.7 This standard is meant to act as guidance to shipbuilders, ship-owners and others concerned with the fitting and use of navigation lights.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (revised).

1. SCOPE

1.1 This standard (Part II) gives the specification for oil lanterns used as navigation lights, for masthead, stern and side lights by large sea-going power-driven vessels.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS: 4601 (Part I) - 1968* shall apply.

3. COMPONENTS OF NAVIGATION LIGHTS WITH OIL LANTERNS

3.1 Navigation lights with oil lanterns shall consist of the following parts:

- a) Lantern cases,
- b) Oil lamps,
- c) Dioptric lens,
- d) Colour slides (for side lights only), and
- e) Reflectors.

4. LANTERN CASE

4.1 The lantern case shall be capable of keeping water or water spray out.

4.2 The lantern case shall be so constructed that the lamp can be inserted in the case with the chimney already in position on the lamp. The lantern case, the up-take of the lantern and lamp chimney shall be concentric.

4.3 The effective optic region of the dioptric lens shall not be obstructed by any projecting features like handle or other parts of the housing. However, the use of vertical rods to hold the top and bottom together is permissible. The breadth of the vertical rods, if placed in front of the lens, shall not exceed 6 mm.

4.4 The lamp shall be movable only laterally through the door opening in the lantern case. For this purpose, runner shall be provided on the bottom of the housing. The length and the spacing between the runner will depend on the size of the lamp. The door in the lantern case shall be provided with a suitable arrangement to secure the door in position.

4.5 The bottom of the lantern case shall be provided with holes for drawing in air and for drainage of condensation water. The ventilation

*Navigation lights for large sea-going power-driven vessels: Part I Positioning and screening of lights.

so provided shall be sufficient to ensure that a burner giving 12 candela will continue to burn in an even and satisfactory manner inside the case, in a still, warm atmosphere. The passages for the admission of air to the interior of the lantern shall have ample area and shall be so arranged that the flame shall not be extinguished or caused to smoke by wind or by the motion of a vessel in bad weather.

4.6 Lantern shall be tested for wind-proofness in a wind of at least 30 knots.

4.7 The height of the back of the lantern case shall not be less than 305 mm and the breadth of port and starboard lanterns shall not be less than 250 mm (*see* Fig. 1).

4.8 The lantern case shall be secured on its side only. If a tongue piece is used for securing lantern case to the screen board, the dimensions of the tongue piece shall be as given in Fig. 2.

4.9 Material

4.9.1 The lantern case shall be made of copper, steel, aluminium alloy, or other non-corrodible metal. The thickness of the material used shall not be less than 0.63 mm. When steel is used, the lantern case shall be fabricated first and the whole unit galvanized.

4.9.2 The tongue piece shall be made of malleable casting of non-ferrous material which shall not corrode under service conditions. The set-screws used for attaching the lantern case shall be M12 (*see* Fig. 2).

5. OIL LAMP

5.1 The lamp shall consist of a cistern, burner and chimney. The recommended shape of chimney and burner are shown in Fig. 3 and 4.

5.2 Cistern—The cistern of the lamp shall be capable of containing sufficient oil to last for 16 hours, in normal use.

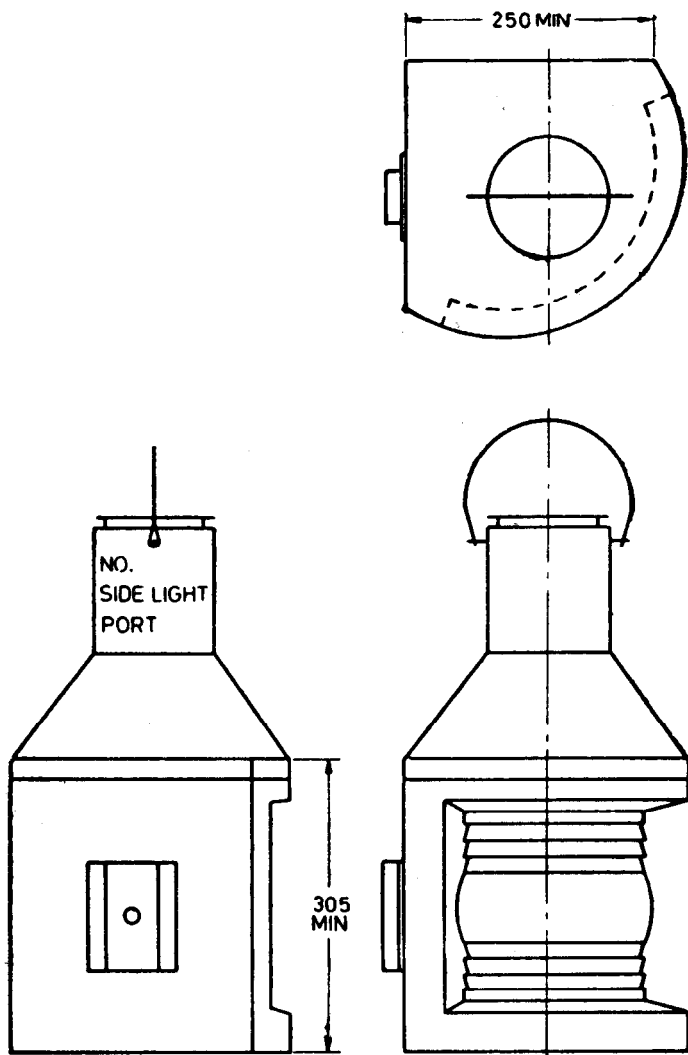
5.2.1 The cistern shall be so placed in the lantern case, that it shall not intercept any of the rays that would otherwise fall on the lower half of the lens.

5.2.2 The base of the lamp shall be so constructed and fitted in the lantern case, that the lamp cannot be placed in, or shifted to an incorrect position.

5.2.3 The cistern for port and starboard lights shall not be interchangeable.

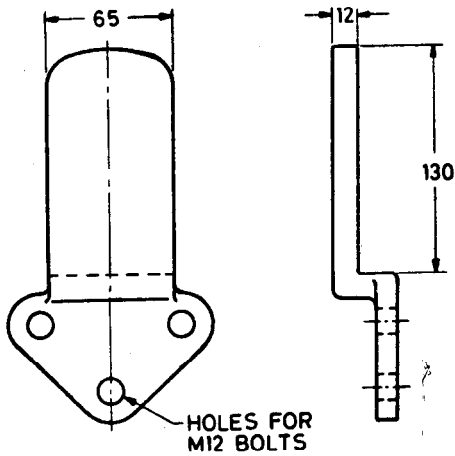
5.2.4 The cistern shall be made of non-corrodible material and shall be leakproof.

5.3 Burner—The burner shall be either a duplex burner taking flat wicks at least 25 mm in width or a single wick burner taking a flat wick at least 32 mm in width. It shall be capable of giving a light having a candle power of at least 12 candela after burning for 2 hours, untrimmed, using an ordinary wick and oil.



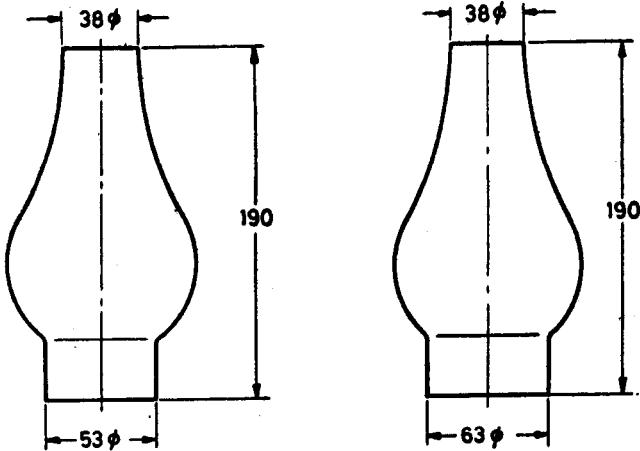
All dimensions in millimetres.

FIG. 1 SHAPE OF SIDE LIGHT PORT OIL LANTERN



All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR TONGUE ON SCREEN BOARD



All dimensions in millimetres.

FIG. 3 DIMENSIONS AND SHAPE OF CHIMNEY

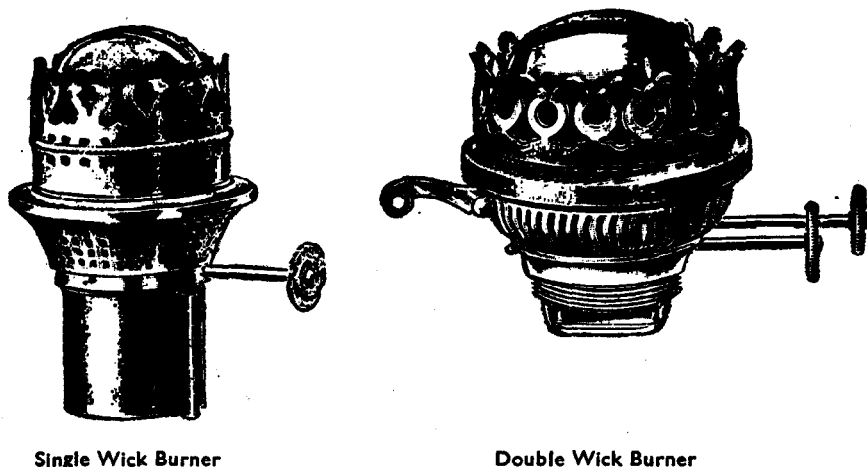


FIG. 4 RECOMMENDED SHAPE OF SINGLE AND DOUBLE WICK BURNERS

5.3.1 The burner shall be so placed that the vertical axis of the lens passes through a point at the middle of the after edge of the wick (the forward wick, if a duplex burner).

5.3.2 For side lights, the burner shall be so placed that the wick(s) are set at an angle of $112^{\circ} 30'$ with the side of the lantern case, and so that a line drawn in this direction from the after edge of the wick (the forward wick, if a duplex burner) cuts the edge of the housing of the lens.

5.3.3 For masthead lanterns, the burner shall be so placed that the wick(s) shall be parallel to the back of the lantern case; further, the burner shall be so placed, that a horizontal line drawn from the centre of the after edge of the wick (the forward wick, if a duplex burner), in a direction making an angle of $112^{\circ} 30'$ on either side with the plane of symmetry of the lantern shall cut the edge of the housing of the lens.

5.3.4 For stern lights, the burner shall be placed as in 5.3.3 and screening shall be as given in IS : 4601 (Part I) - 1968*.

5.3.5 The burner shall be so placed that the effective visibility of the lantern fulfils the requirements of 'Indian Standard specification for dioptric lens for navigation lights' (*under preparation*).

5.3.6 The burner shall be so registered that it cannot be placed in or shift to an incorrect position.

*Navigation lights for large sea-going power-driven vessels: Part I Positioning and screening of lights.

5.3.7 The distance from the centre of the after edge of the wick (the forward wick, if a duplex burner) to that part of the lantern against which the tongue of the screenboard presses should always be 125 mm.

5.4 Chimney—Unless the lantern case is of special form, designed to enable the burner to give at least 12 candela without the use of a chimney, a suitable glass chimney shall be fitted.

5.4.1 The chimney shall be of clear colourless glass, shall be of round (not oval) section, shall be not less than 37 mm internal diameter at the top, and shall have an overall length of not less than 187 mm. In the commoner forms of chimney, the curvature of the glass between the bulge and the neck of the chimney shall be quite gradual.

6. DIOPTRIC LENS

6.1 Dioptric lens used with oil lanterns for navigation light shall be in accordance with 'Indian Standard specification for dioptric lens for navigation lights' (*under preparation*).

7. COLOUR SLIDES

7.1 The colour slides for port and starboard side lights shall be in accordance with 'Indian Standard specification for colour slides for navigation lights' (*under preparation*).

8. REFLECTORS

8.1 The lantern shall be fitted with a substantial metal reflector, silver-plated and highly-polished. The surface of the reflector shall be part of a sphere having its centre at the optical centre of the lens.

8.2 The reflector shall not be so large as to intercept any of the direct rays which should fall on the lens.

8.3 The reflectors shall not be so small that a line drawn from any part of the lens through the centre of the flame will fail to fall on its surface.

8.4 Reflectors for side and masthead lanterns shall not be interchangeable.

9. TESTING

9.1 All dimensions shall be checked for adherence to the minimum requirements of this standard.

9.2 The lights shall be tested according to the requirements of IS: 4601 (Part I) - 1968*.

*Navigation lights for large sea-going power-driven vessels: Part I Positioning and screening of lights.

9.2.1 Side lights shall be tested for a visibility of 3·219 km on a dark night with a clear atmosphere, with naked eye.

9.2.2 Masthead lights shall be tested for a visibility of 8·047 km on a dark night with a clear atmosphere, with naked eye.

10. MARKING

10.1 The casings of navigation lights shall be marked with the manufacturer's number and type of light (*see* Fig. 1).

10.2 The lamp shall be marked with the same serial number of the manufacturer as on the lantern casing.

10.3 The cistern shall be marked with its capacity in litres.

10.4 Navigation lights may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on the products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production in this system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m s ⁻²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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